

WEST

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L2: Entry 1 of 2

File: DWPI

Aug 16, 2001

DERWENT-ACC-NO: 2001-496303

DERWENT-WEEK: 200154

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TITLE: Megasonic cleaning method used for removing contaminants from wafer surface involves immersing substrate which is spaced from transducer, in cleaning fluid and applying energy generated by transducer to substrate

INVENTOR: BUSNAINA, A A

PATENT-ASSIGNEE:

ASSIGNEE

BUSNAINA A A

CODE

BUSNI

PRIORITY-DATA: 2001US-0819578 (March 28, 2001), 1998US-104131P (October 14, 1998),
1999WO-US02686 (February 8, 1999), 2000US-192531P (March 28, 2000), 2000US-0655038
(September 5, 2000)

PATENT-FAMILY:

PUB-NO

US 2001013355 A1

PUB-DATE

August 16, 2001

LANGUAGE

PAGES

013

MAIN-IPC

B08B003/12

APPLICATION-DATA:

PUB-NO

US2001013355A1

APPL-DATE

October 14, 1998

APPL-NO

1998US-104131P

DESCRIPTOR

Provisional

US2001013355A1

February 8, 1999

1999WO-US02686

CIP of

US2001013355A1

March 28, 2000

2000US-192531P

Provisional

US2001013355A1

September 5, 2000

2000US-0655038

CIP of

US2001013355A1

March 28, 2001

2001US-0819578

INT-CL (IPC): B08 B 3/12

RELATED-ACC-NO: 2000-364675

ABSTRACTED-PUB-NO: US2001013355A

BASIC-ABSTRACT:

NOVELTY - A substrate (90) is spaced parallel from the megasonic transducer (210) active surface, inside the container. A cleaning fluid (220) is passed through the space between the substrate and the transducer for immersing the substrate in the fluid. Energy (270) generated by the transducer is applied to the substrate.

DETAILED DESCRIPTION – An INDEPENDENT CLAIM is also included for substrate cleaning apparatus.

USE – The method is used for removing the particulates and chemical contaminants e.g. oxide, metallic or polymer films, from the surface of semiconductor wafer, glass or quartz flat panel display glass, hard disk drives and heads and used for photomask cleaning processes, chemical-mechanical polishing processes.

ADVANTAGE – The surface of the wafer is cleaned in a very short period without using any chemicals other than de-ionized water. Particle removal efficiency is improved. Yield of the wafer is increased and cost of semiconductor products formed on wafers are reduced. Eliminates the need for batch cleaning process.

DESCRIPTION OF DRAWING(S) – The figure shows the schematic cross-sectional view of the megasonic cleaning apparatus.

Substrate 90

Liquid cleaning medium 220

Megasonic transducer 210

Megasonic energy 270

CHOSEN-DRAWING: Dwg.2/8

TITLE-TERMS: CLEAN METHOD REMOVE CONTAMINATE WAFER SURFACE IMMERSE SUBSTRATE SPACE
TRANSDUCER CLEAN FLUID APPLY ENERGY GENERATE TRANSDUCER SUBSTRATE

DERWENT-CLASS: L03 P43 U11

CPI-CODES: L04-C09;

EPI-CODES: U11-C06A1B;

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C2001-148971

Non-CPI Secondary Accession Numbers: N2001-367783

WEST**End of Result Set**

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L2: Entry 2 of 2

File: DWPI

Apr 20, 2000

DERWENT-ACC-NO: 2000-364675

DERWENT-WEEK: 200031

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TITLE: Megasonic cleaning of semiconductor wafers comprises arranging substrate and transducer in parallel at preset distance through which cleaning fluid is supplied and applying megasonic energy to transducer

INVENTOR: BUSNAINA, A A

PATENT-ASSIGNEE:

ASSIGNEE

CODE

BUSNAINA A A

BUSNI

PRIORITY-DATA: 1998US-104131P (October 14, 1998)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 200021692 A1	April 20, 2000	E	024	B08B003/12
AU 9928672 A	May 1, 2000		000	B08B003/12

DESIGNATED-STATES: AU CA CN IL JP KR MX NZ RU SG US AT BE CH CY DE DK EA ES FI FR GB GR IE IT LU MC NL PT SE

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
WO 200021692A1	February 8, 1999	<u>1999WO-US02686</u>	
AU 9928672A	February 8, 1999	1999AU-0028672	
AU 9928672A		WO 200021692	Based on

INT-CL (IPC): B08 B 3/12; H01 L 21/00

RELATED-ACC-NO: 2001-496303

ABSTRACTED-PUB-NO: WO 200021692A

BASIC-ABSTRACT:

NOVELTY - The substrate (90) to be cleaned and a megasonic transducer (210) are arranged in parallel in a tank (25) at a predetermined distance and are moved relatively in a parallel direction. Cleaning fluid (220) is supplied through the space between the substrate and the transducer having a transducer area

of 40–100% to that of substrate and megasonic energy at 400 kHz is applied on transducer.

DETAILED DESCRIPTION – The distance between the substrate and transducer is 1–80% of the maximum diameter of the substrate, i.e. 1 μ m – 160 mm. The megasonic power applied to the transducer is at least 20–100% of the maximum power of 400 watts such that the ratio of total input power to the transducer area is 4 watts/cm². The fluid flow rate is such that it replaces the fluid in the entire volume of the tank in less than or equal to one minute and is sufficient to carry particles away from the substrate before they redeposit on it.

An INDEPENDENT CLAIM is also included for megasonic cleaning device.

USE – For cleaning semiconductor wafers, flat panel display glass, hard disk drives, etc.

ADVANTAGE – The cleaning method does not involve the use of chemicals other than deionized water. The cleaning method delivers maximum megasonic energy to each square centimeter of wafer area for the entire duration of cleaning without the need for wafer rotation, thus increasing its efficiency and effectiveness. The cleaning method reduces cleaning time to 15 seconds, improving cleaning efficiency.

DESCRIPTION OF DRAWING(S) – The figure shows a cross-sectional view of the megasonic cleaning device.

Tank 25

Substrate 90

Megasonic transducer 210

Cleaning fluid 220

CHOSEN-DRAWING: Dwg.2/6

TITLE-TERMS: CLEAN SEMICONDUCTOR WAFER COMPRISE ARRANGE SUBSTRATE TRANSDUCER PARALLEL
PRESET DISTANCE THROUGH CLEAN FLUID SUPPLY APPLY ENERGY TRANSDUCER

DERWENT-CLASS: P43 U11 V06

EPI-CODES: U11-C06A1B; U11-C09X; V06-B03; V06-D;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N2000-272926